BEFORE THE TIMARU DISTRICT COUNCIL

IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	An application for Resource Consent by Bayhill Developments Limited

STATEMENT OF EVIDENCE OF PHILLIP PATERSON

Dated: 23 November 2016

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INTRODUCTION

1 My name is Phillip Paterson. I am a Director and Structural Engineer with Powell Fenwick Consultants Limited (Powell Fenwick). Powell Fenwick is a Christchurch based engineering consultancy with a complete range of civil, structural, mechanical, hydraulic, acoustic, electrical and fire engineering services. We have a major focus on environmentally sustainable design.

2 I hold the qualifications of B.E. (Hons) from Canterbury University. I am a full member of IPENZ, MIEAust and a Chartered Professional Engineer in both New Zealand and Australia.

3 I have nearly 20 years of experience as a Structural Engineer, working across New Zealand and Australia, and have been a Director of Powell Fenwick since 2011. I have particular experience in Detailed Structural Engineering Evaluations (DEE) and Earthquake Damage Assessments.

4 My specific experience includes the following relevant projects where the retention and restoration of the building was explored. The majority of these cases were buildings with similar structures to the Hydro Grand Hotel (such as those with unreinforced masonry).

(a) Gough House, 90 Hereford Street, Christchurch (demolished);

(b) Crichton Cobbers, Corner of Fitzgerald and Chester Street, Christchurch (demolished);

(c) Quinns Building, 195 Papanui Road, Christchurch (unreinforced masonry and had to be demolished);

(d) 88 Moorhouse Ave, Christchurch (unreinforced masonry and had to be demolished);

(e) F Block, ARA Polytechnic, Christchurch (demolished);

(f) VH Block, ARA Polytechnic, Christchurch (currently undergoing Resource Consent to demolish);

(g) OMC Power Equipment Building, 100 Gasson Street, Christchurch (Unreinforced masonry, concrete frame. Powell

Fenwick did the earthquake strengthening and the remedial work for the parapets and the building did not have to be demolished).

5 I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014. I have complied with it in preparing this evidence and I agree to comply with it in presenting evidence at this hearing. The evidence that I give is within my area of expertise except where I state that my evidence is given in reliance on another person's evidence. I have considered all material facts that are known to me that might alter or detract from the opinions that I express in this evidence.

6 I note that Brian Schimke, Senior Structural Engineer of Powell Fenwick, completed the most recent site visit on 6 November 2015. Malcolm Freeman, Structural Director, and Hannah Clarke, Senior Structural Engineer (both of Powell Fenwick), undertook the earlier structural assessments completed in 2008. I have relied upon the observations and reporting of these engineers in the preparation of my evidence.

SCOPE OF EVIDENCE

7 Powell Fenwick prepared a Preliminary Design Report for Bayhill Developments Limited on 13 April 2016 (Preliminary Report). The purpose of this report was to review the condition of the existing Hydro Grand Hotel (the Hydro Grand) building in Timaru and the scope of work included an assessment of the following refurbishment options available:

(a) Retention and restoration of existing building within the existing building envelope (the primary use).

(b) Retention of façade – demolishing all internal elements and building new within existing building envelope.

(c) Retention of façade – demolishing all internal elements and building new to 20m height limit.

8 The report also addressed the potential for alternative uses which included:

(a) Hotel (the primary use).

(b) Commercial office with complementary ground floor retail.

(c) Residential apartments.

9 My evidence is informed by the information contained in the preliminary report. To the best of my knowledge no major events have occurred between 13 April 2016 and 23 November 2016 that would affect the condition of the building and thus the findings referred to throughout this statement.

EXECUTIVE SUMMARY

10 The building is currently earthquake prone at only 10% National Building Standard (NBS). It requires significant structural upgrade work to reach the minimum standard of 34% NBS and significantly more to reach the suggested 67% NBS or the desired 100% NBS.

11 A number of different options for the adaptive re-use of the Hydro Grand building have been explored. These options have considered the requirements of legislation such as the New Zealand Building Act 2004 (NZBA) and the Timaru District Council Earthquake-Prone, Dangerous & Insanitary Buildings Policy[1] (Timaru EQ Policy) as well as the structural strengths required for each of the different uses proposed.

12 Ten different options involving the retention and strengthening of the existing building have been considered. While all options are technically feasible, I note that the amount of strengthening work required to meet the requisite standards will result in little of the original fabric of the building remaining. The work is also extensive and therefore costly.

HYDRO GRAND STRUCTURE

Building Description

13 All of the external walls of the building, including those that face the enclosed central area are unreinforced masonry (red brick). In

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[1] http://www.timaru.govt.nz/__data/assets/pdf_file/0018/19404/383300-Earthquake_Prone,_Dangerous_and_Insanitary_Buildings_Policy_-_Oct_2006_AN-01.pdf

addition, a number of the internal walls at the ground floor level are also comprised of unreinforced masonry.

14 The exterior walls of the building which face onto Sefton Street and The Bay Hill have a painted plaster finish. All of these walls are supported on concrete foundations. None of the building materials are unusual or especially unique (such as stone) and the street and external finishes could be replicated in a more durable and stronger form with modern materials.

15 The floors throughout the building are timber framed and consist of tongue-in-groove floor boards supported on timber floor joists. These in turn are supported on a mixture of timber framed walls, unreinforced masonry walls and steel beams depending on the location within the building.

16 Along the northern side of the building the upper two levels have balconies that overlook the street. These are also timber framed floors with an asphalt type material forming the wearing surface over the top of the timber structure.

17 The roof is clad with lightweight iron over a framed timber structure. The pitch of the roof is such that there is a relatively large space within the roof structure which houses several water tanks and other mechanical and hydraulic plant items.

18 In the South-East corner of the building there is a circular domed turret which extends to the roof height. This is formed from plastered brick parapets extending to balustrade heights with a domed roof sitting on columns above.

Building Condition

19 The building, in its current state, would have to undergo significant compulsory repairs and upgrade in order to satisfy the requirements of the NZBA.

20 As stated previously, the most recent detailed inspection of the premises was completed on behalf of Powell Fenwick by Brian Schimke on 6th November 2015. Generally this inspection corroborated observations made during a previous inspection in 2008 namely that:

(a) The existing building is Earthquake Prone under the definition given in the NZBA. Based on this, any significant alteration to the building or a Change of Use will require the building to be structurally strengthened in accordance with the New Zealand Society for Earthquake Engineering (NZSEE) guidelines for Earthquake Prone buildings.

(b) Strengthening of the building would be difficult, expensive, and impose significant limitations on the form and utilisation of the building in a way which is not compatible with the ideal site utilisation or with an integrated hotel facility.

21 The 2015 inspection further revealed that the water damage and rot was worse than that reported in 2009, to the point that I consider much of the existing timber framing will require replacement, especially at the ground floor.

22 The 2015 report was also informed by the recent seismic events in the Canterbury region that illustrated how poor unreinforced masonry (red brick) buildings and facades behave in an earthquake.

23 There was no observed significant earthquake damage to the building in either 2008 or 2015. Cracking to the external and internal linings was noted in 2008 but does not appear to be related to seismic movement. The overall structure of the building does not appear to have been affected significantly by the Canterbury earthquakes in 2010 and 2011.

24 At all levels of the building, there is evidence of water damage, animal faeces, and significant mould. Furthermore, based on the age and type of the building it is likely that there may be asbestos in the ceiling linings at several locations throughout the building.

STRENGTHENING REQUIREMENTS

Legislation

25 Section 131 of the NZBA requires each local authority to have their own policy on dangerous, earthquake-prone, and insanitary buildings. Section 131(2)(c) states that "*the policy must state… how the policy will apply to heritage building.*"

26 The Timaru District Council's "Managing Earthquake Prone Buildings" framework also states that "*Once the Council determines that a building is earthquake-prone and notifies the building owner, the owner must strengthen or demolish the building within the given timeframe*."[2] The priority of the building is taken in to consideration, for example hospitals and emergency facilities are most important, followed by educational institutions, unreinforced masonry buildings that could collapse on to the street and buildings that could impede main transport routes. The Hydro Grand Building is of considerable priority in that it is both an unreinforced masonry building that could collapse on to the street and should that occur access to the main street of Timaru would likely be impeded

27 The Timaru EQ Policy[3] requires that a building be checked for structural compliance with the current building code when any one of the following occurs:

(a) When application for building consent is received; or

(b) When a change of use occurs; or

(c) When application for Certificate of Acceptance is received (subject to the building work having been carried out after the introduction of this policy); or

(d) When complaints or concern is received about the state of a building and the Council considers there are grounds for further investigations and assessment.

28 The Policy refers to the NZBA in defining "Earthquake-Prone" buildings as those that "*will have its ultimate capacity exceeded in a moderate earthquake; and would be likely to collapse causing injury or death to persons in the building or to persons on any other property; or damage to any other property*." A "moderate" earthquake is defined as "*an earthquake that would generate shaking at the site of the building … that is one-third as strong as, the earthquake shaking … that would be used to design a new building at that site*." The comparison of the structural strength of existing buildings to new buildings, or new building code provisions, at the

[2] https://www.timaru.govt.nz/__data/assets/pdf_file/0017/80333/1013641-New-Framework-for-Managing-Earthquake-Prone-Buildings.pdf

same site is referred to as a percentage of New Building Standard, or % NBS.

Timaru District Council Requirements

29 The Timaru EQ Policy requires that any building identified as earthquake prone be strengthened to a degree sufficient to remove the earthquake prone status. Thus, where earthquake prone is defined as less than 1/3 NBS, any building identified as earthquake prone must be strengthened to a minimum of 34% NBS.

30 It is important to note that the requirements to strengthen an earthquake prone building to a minimum level of 34% NBS is an absolute minimum requirement under the NZBA. The Timaru EQ Policy goes further to state that the NZSEE guidelines are the preferred basis for defining technical requirements and criteria for strengthening existing buildings. This document specifies that strengthened buildings should in all cases be upgraded to approximately 67% of current building code.

31 In line with the NZSEE guidance, although 67% of NBS represents a reduced strength of building and still poses a risk of severe damage in a full code-level earthquake it is considered acceptable to the wider community for this to happen in order to accommodate the economic reality that older buildings pose to owners and the society in general.

32 For the case where a building is to undergo a change of use, the Building Act Section 115 requires that the building comply with the provisions of the current building code as close as is "reasonably practicable," or as Christchurch City Council require, to 100% NBS.

33 Powell Fenwick Consultants has completed a structural assessment of the existing Hydro Grand building and confirm that, in accordance with the definitions presented above, the building is earthquake-prone. We have estimated the strength of the existing building to be as low as approximately 10% NBS.

Suitability for Strengthening

34 The structure of the building is such that although it could be strengthened using a traditional approach, there are several factors

that would impact on the level of difficulty for this building and hence would impact on the cost of the upgrade work and the future use of the building space.

35 The internal walls of the building form the gravity support for the upper floor levels, thus they cannot be removed without the requirement of a new structure to replace the support they provide. This means that any floor diaphragms to increase the building strength are required to be stopped and started on each side of the walls. This requires plywood fixings and steel in excess of that which would be expected in a more typical plywood diaphragm building.

36 Removal of the internal walls, while most likely desirable from a room layout planning point of view, would require the placement of new structure to re-support the floor. This would require structural steel beams to be placed to achieve the required support conditions. Depending on the proposed arrangement of the beams and wall removal, it may be necessary to carry new posts through the full height of the building and form new foundations to support them.

37 The lack of sufficient header bricks tying the skins of the external and internal brick walls together requires steel members to provide the required face load support capacity. These members are required at relatively close spacing around all the masonry walls over the full height of each level. In some cases these posts will interfere with the current window opening locations. Additionally, the placement of these members will cause a significant reduction in the useable floor area over the three levels of the building.

38 As described at the end of this statement, all services will require replacement as part of the strengthening and refurbishment of the existing building. This would require numerous new penetrations to the floor diaphragms, walls and linings to achieve the required fit out. It would also affect the internal linings of the building as any development would most likely include the concealment of any new services requiring new bulkheads or cavity spaces to run services. This could again see a reduction in the useable floor area of the building.

39 It should be noted also that a building that has been strengthened in accordance with the NZSEE guidelines (i.e. to 67% NBS) will be

sufficient to achieve the desired level of building code specified earthquake load for a new building at the time of design. This means that although strengthened, it cannot be guaranteed that in the future the building will not require additional strengthening to meet any future regulations as the building code grows and changes in light of increased engineering knowledge and experience, as has been very recently exhibited in the Canterbury Earthquake sequence. While 100%NBS is desirable (particularly for buildings with high public use such as hotels) this is very difficult.

OPTIONS CONSIDERED FOR ADAPTIVE REUSE

40 A number of options have been considered for the adaptive re-use of the existing Hydro Grand building. The options have been split into 3 groups. The first group of options involves the retention and re-use of the existing building. The second group of options involves the retention of the façade only with a new building within the existing building envelope. The third group of options involves retaining the façade and building new up to 20 metres in height.

41 For each of the 3 groups we have considered what would be required to enable use of the building as a hotel, offices and retail and apartments (all of these options have different functional requirements and different requirements under the building code).

42 In summary the options considered were:

(a) Option 1 - Retention and Reuse of the Existing Building, maintaining the hotel use with 34%NBS, 67-80%NBS and 100%NBS.

(b) Option 1A - Retention and Restoration of the Existing Building within the Existing Building Envelope – convert the attic space into additional accommodation space;

(c) Option 1B - Retention and Restoration of the Existing Building within the Existing Building Envelope for use as an office building with ground floor retail;

(d) Option 1C - Retention and Restoration of the Existing Building within the Existing Building Envelope for use as an apartment building;

(e) Option 2A - Retention of the Façade Only and Building New Within Existing Building Envelope – Hotel Use;

(f) Option 2B - Retention of the Façade Only and Building New Within the Existing Building Envelope – Commercial Office Use with Ground Floor Retail;

(g) Option 2C – Retention of the Façade Only and Building New Within the Existing Building Envelope – Residential Apartment Use;

(h) Option 3A – Retention of the Façade and Building New Up to 20 metres in Height – Hotel Use;

(i) Option 3B - Retention of the Façade and Building New Up to 20 metres in Height – Commercial Office Use with Ground Floor Retail;

(j) Option 3C - Retention of the Façade and Building New Up to 20 metres in Height – Residential Apartment Use.

Option 1 – Retention and Reuse of the Existing Building, maintaining the hotel use with 34% NBS, 67-80% NBS and 100% NBS.

43 The Hydro Grand building in Timaru has been assessed as earthquake-prone therefore under any scenario strengthening works to remove the earthquake-prone status of the building will be required.

44 The first option explored is the retention and restoration of the existing building, using the existing structural elements and building fabric as much as possible. We note, however, that in consideration of the compulsory repairs detailed in our preliminary report, as well as the requirements described in the following sections, very little of the original structure may remain. This consists of the roof structure, some floor joists (where they have not been effected by water damage and rot), and the brick exterior.

45 In consideration of the legislation described above, Powell Fenwick analysed the strengthening requirements of this scenario to achieve 34% NBS, 67%-80% NBS, and 100% NBS.

34% New Building Standard

46 This is the absolute minimum level of strengthening required to remove the earthquake-prone status of the building and thus render it 'usable'.

47 To achieve this new diaphragms are required at all levels of the building with positive fixings into the masonry walls around the edges of the building. This would be achieved using screw fixed 20mm plywood, fixed either as a ceiling or floor overlay. Around the masonry walls fixings and connections would be required to enable the placement of drilled and epoxied anchors to transfer the load from the plywood diaphragm into the masonry walls. At any internal walls, the plywood would be required to stop each side of the walls. Fixings and additional straps would be required at the wall lines to effectively provide continuity of the plywood through the timber walls. Alternatively, the plywood could pass above or below the walls although this is likely to require a large amount of disruption to the wall linings and structure.

48 New vertical square hollow section (SHS) posts, in simple terms 'steel columns', would be required to be attached to the masonry walls to provide the strength required to hold up the walls under seismic face and gravity loads. These would be required to all of the masonry walls over the three levels of the building at approximately 1m centres and would be fixed into the wall using drilled and epoxied fixings.

49 The dome structure at the corner of the building would require strengthening by installation of a concrete beams and columns at each level to resist the earthquake load, continuous through the full height of the building. In the dome itself a further structure would be required to provide the required connection between the dome's roof and the supporting structure. This concrete frame may be used to further strengthen this corner of the building as it is currently an acute angle with little lateral bracing available for loads perpendicular to the angle. In short, this corner is less strong than the rest of the building currently.

50 The existing foundations require underpinning to provide the required strength to the brick walls for both in-plane and out-of-plane loads.

At the location of the proposed concrete portal frame, a large concrete pad sat upon steel screw piles is required to resist large potential uplift loads.

51 Completing this work would elevate the building from 10% NBS to 34% NBS being the minimum level needed to remove the buildings earthquake prone status.

67% - 80% New Building Standard

52 As previously mentioned however, the Timaru District Council refers to the NZSEE guidelines as the basis for establishing strengthening requirements for existing buildings. These guidelines specify that buildings should be strengthened to a level of approximately 67% NBS.

53 Therefore using the 34% NBS as a baseline scope of works, the strength of parts of the masonry walls require further upgrade to achieve 67% NBS. This can be achieved by applying a concrete skin to the inside face of the walls either as poured or sprayed reinforced concrete. In these noted locations, the SHS posts required elsewhere may be foregone. We note that these skins are required full-height of the building, which will require the existing floor structure to be altered to allow complete access to these walls. These alterations may include cutting short the existing framing and fitting new ribbon plates, joist hangers, blocking, etc. Additionally, some existing windows may have to be in-filled with concrete and steel to allow the walls to run full height, uninterrupted.

54 The foundations noted for this scheme will also require larger underpins and additional reinforcing to those sizes and quantities indicated in the 34% NBS scheme.

55 If strengthening to 80% NBS is necessary (for insurance or tenancy purposes) then a 20% increase in cost of materials would be incurred over and above that which is required to meet the NZSEE recommended 67% NBS.

100% + New Building Standard

56 The requirement to strengthen to 100% NBS would likely be triggered if the building is to undergo a change of use and be used

for any purpose other than a hotel (in accordance with the NZBA section 115). Strengthening to this level is also desired by many hotel guests and may be required to satisfy hotel operator requirements. This level of strengthening will provide for structural performance equivalent to that of a new building designed and constructed to all of the current and relevant provisions of the NZBA. However, strengthening the building to 100% NBS requires a substantial amount of additional work beyond that of the 67% NBS scheme.

57 In addition to the new diaphragms, foundations, and concrete skins already discussed in the above scenarios, all remaining brick walls will require new in-situ concrete skins on the internal face to provide the strength against in-plane and out-of-plane seismic loads. The installation of these concrete walls will lead to the brick walls behaving as a brick veneer contributing seismic weight but not seismic resistance to the building. This additional weight will require more frequent fixings in the plywood diaphragms and into the supporting walls, as well as enhanced foundations at the ground floor. We note that the steel posts described in the previous sections may be foregone as all walls will be reinforced with the concrete skin.

58 These skins are required full-height of the building, which will require the existing floor structure to be altered to allow complete access to these walls. These alterations may include adjusting the old to fit the new, such as cutting short the existing framing and fitting new framing and connections to provide continuity throughout. Additionally, some existing windows may have to be in-filled with concrete and steel to allow the walls to run full height, uninterrupted.

Option 1A - Retention and Restoration of the Existing Building within the Existing Building Envelope – convert the attic space into additional accommodation space

59 Option 1A investigated whether the attic could be used for additional accommodation space as there is sufficient space in the attic for this to take place and to do so might help the commercial viability of the project. To use the attic space as additional accommodation space requires additional strengthening and will likely require the addition of new lateral load-resisting elements.

60 The use of the attic effectively converts the ceiling of the building into a serviceable floor which has greater associated design seismic mass that must be accounted for. This additional mass at the top of the structure will result in greater force demands on the lateral systems of the building. We further note that the conversion of the attic space into floor space may be interpreted as a change of use and therefore the new attic space would have to be designed to 100% NBS, in accordance with Section 17 of the NZBA. Subsequently, the entire structure may then require strengthening to 100% NBS.

61 The 100% NBS strengthening scheme is therefore used as a baseline scope of works for this option. We would then expect that internal bracing walls or steel frames will be necessary to resolve the increased loads from the attic conversion. These bracing elements will have to extend up the height of the building, internally, and be set on new foundations.

Option 1B– Retention and Restoration of the Existing Building within the Existing Building Envelope for use as an office building with ground floor retail

62 The design loads of an office occupancy are greater than those of a hotel or apartment building and so additional strengthening work will be required to facilitate this conversion. Additionally, as previously noted, a change of use may require the building to be strengthened to 100% NBS, or as near as reasonably practicable. Thus, we have used the 100% NBS strengthening work previously referred to as a baseline for this scope of works, but increased materials by approximately 50% to compensate for the additional load of an office occupancy.

Option 1C - Retention and Restoration of the Existing Building within the Existing Building Envelope for use as an apartment building

63 If converting the hotel to an apartment building, it is again likely that this will be considered a change of use and require strengthening to 100% NBS. In this instance however, the design loads of an apartment occupancy are effectively the same as those for a hotel and therefore no further strengthening will be required over and above the baseline scope of works.

Options 2 and 3 – Retention of the Façade Only and Building New Within the Existing Building Envelope or up to 20 Metres in Height

Option 2A – Retention of the Façade: demolishing all internal elements and building new within existing building envelope for hotel use

64 To retain the existing façade and remove the interior structure will require the installation of a new steel skeleton supported on new foundations and tied into the remaining masonry façade. This could be accomplished by introducing a skin of in-situ concrete to the back of the brick façade, and using steel RHS posts as regular centres to connect to the façade and the supporting steel structure at the floor levels, similar to the work described in the 100%NBS scheme. New floors may be constructed of timber joists with plywood flooring to create structural diaphragms, as previously described. These diaphragms will lend strength and stiffness to the steel frames to better resist the seismic mass of the retained façade. Steel braced frames will be used as the primary lateral load resisting elements and will be distributed regularly throughout the building footprint to ensure a predictable and reliable performance in future earthquakes.

Option 3A – Retention of the Façade and Building New Up to 20 metres in Height – Hotel Use

65 If increasing the building height to 20m, the same principle of a new steel skeleton and strengthening works to the facade as described above will be required. To facilitate the construction of the additional height, the steel skeleton will have to extend full height. Heavier steel columns will be required throughout the building, and foundation sizes will increase. The steel frames used to brace the structure will also need to be appropriately upsized. New floors may be constructed of timber joists and steel beams. We note that this will result in significant additional costs, in all aspects of the structure, including material, labour, design, etc., as 20m is approximately twice the height of the existing building.

66 In accordance with section 17 of the NZBA as a new building, the new structure must be designed to 100% NBS.

Option 2B - Retention of the Façade Only and Building New Within the Existing Building Envelope – Commercial Office with Ground Floor Retail use

67 A change of use to office facilities will trigger the requirement for strengthening to 100% NBS. In addition, as previously mentioned, the design loads for an office occupancy are greater than those of a hotel, or apartment building and therefore work beyond that of the Option 2A scheme will be necessary. For Option 2B, (to retain the façade and build a new structure internally) we would expect a 50% increase in materials, including heavier steel sections, additional reinforcing in the foundations, larger fixings, etc. over and above the Option 2A strengthening scheme This is due to the requirement that the new steel structure support the heavier design load associated with the office occupancy as opposed to the hotel occupancy.

Option 3B - Retention of the Façade and Building New Up to 20 metres in Height – Commercial Office Use with Ground Floor Retail

68 To retain the façade and build a new structure internally to 20m height, while converting the facility to office space, will require the same degree of work as described for Option 3A, but will require heavier steel sections, larger foundations with more reinforcing steel, larger and more frequent fixings, etc., again, in response to the heavier occupancy load. This could be in the order of a further 50% increase in material over the Option 3A work.

Option 2C and 3C– Retention of the Façade Only and Building New Within the Existing Building Envelope – Residential Apartment Use

69 As the design loads of commercial apartments are equivalent to that of a hotel, the same structural strengthening requirements of Options 2A and 3A will be required.

70 As can be seen from the above there are a range of variables in terms of the usage of the built form and the relevant NBS requirements that must be considered in each scenario.

BUILDING SERVICES (MECHANICAL AND ELECTRICAL)

71 In addition to the structural matters outlined, as mentioned earlier, the mechanical and electrical services in the building are beyond

their economic life and will need complete replacement for any future development of the building.

72 While it is possible to reuse parts of the existing building and façade, this will increase the cost of installing new services due to the added complexity of the retrofitting process and the obstruction caused by the structural strengthening requirements.

CONCLUSION

73 In summary, an extensive range of repair and replacement options have been considered. The work required to the building to bring it to the minimum of 34% NBS is still very significant however such a level is unlikely to satisfy the owner, tenants or the Council. While 67% NBS may be acceptable to the Council, any change in use would trigger a requirement for strengthening as near as practicable to 100% NBS. It is also likely that 100% NBS would practically be required by tenants and as such by the owner. In these circumstances it is prudent to anticipate the works necessary to bring the building to 100% NBS and we have undertaken this assessment (while still considering the lesser options). The work to achieve this is very significant and will require extensive modification of the existing interior of the Hydro Grand.

Phillip Paterson

23 November 2016